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Under Pressure to Aid Economy

NSF Moving Toward Bigger Role in Industrial Research

After decades of a proud, stubborn stance as the US government's unique bankroll for academic basic research, the National Science Foundation is yielding to a mounting political chorus and pointing itself toward major financial responsibility for industrial research and technology.

The reorientation overlaps with a rare event in NSF history, a virtually assured standstill budget from Congress for the coming fiscal year, with no reason to expect better times in the near future. In recent years, under political pressure and the anxious gaze of its traditional basic-science constituency, NSF has gradually expanded its engineering programs and ties to industry, perhaps to about 12-15 percent of the budget. A series of closely occurring omens suggest a far bigger slice, with ensuing agonies for academic basic research.

The National Science Board (NSB), the Presidentially appointed policymaking body for NSF, has just endorsed a report that notes a paucity of federal funds for "R&D of direct relevance to commercial technology." Titled *The Competitive Strength of US Industrial Science and Technology: Strategic Issues*, the report was produced by the NSB's Committee on Industrial Support for R&D, co-chaired by Roland Schmitt, President of Rensselaer Polytechnic Institute, and Arden L. Bement Jr., TRW Vice President for Science and Technology. Basically, it's a brief for enlisting NSF in Washington's crusade for industrial competitiveness. Where the money is to come from, it doesn't say.

The report recommends "Increasing support of research and education on engineering design, manufacturing processes, and programs that emphasize systems integration in engineering education." And, coyly asking whether NSF "should encourage the development of new kinds of university programs that integrate engineering and management education programs?" the report observes: "Any significant change in this direction would represent a substantial departure from NSF's traditional role, and thus should be given careful examination."

The Co-Chairmen of the report are veterans of Washington science-policy affairs and receive attention in the R&D

(Continued on Page 3)

Forget the NIH Strategic Plan, SGR Has a Better Idea—P. 5

Spending Restraints Bite Hard

Research Agencies Taking A Beating on Capitol Hill

A grim budget outcome is shaping up for federal research agencies as the Congressional session heads into the homestretch. Even the National Institutes of Health, the darling of Capitol Hill, has taken a bruising at crucial points in the appropriations process. There's little time, political will, or loose money to pull off a miraculous reversal in the closing days.

For a national scientific enterprise that has long suffered from a painful gap between aspirations and resources, the worst is yet to come. That's what SGR hears around Washington—without a contrary note. The survival of the Space Station and the Superconducting Super Collider in

(Continued on Page 2)

In Brief

The tumult created by NIH's massive filings of patents for partial DNA sequences is not likely to be calmed by the long-awaited report of the Genome Patent Working Group, created late last year to study the issues for the Federal Coordinating Council on Science, Engineering, and Technology. Dated July 29, a draft of the 19-page report obtained by SGR shows that, as charged, the Working Group confined itself to identifying issues, 5 of them, discussing "implications," and listing options, 13 in all. No policy groundbreaking and no recommendations are offered.

When Washington's biomedical-policy community gets down to shop talk, the invariable topic is Hurricane Healy, whose media celebrity exceeds that of all previous Directors of NIH. Opinions vary widely on this or that, but on one point there's universal agreement: great ambition. For what? The gossip mill originally fixed on the post of Secretary of Health and Human Services, with lesser ranking for Presidential Science Adviser. The latest on Healy, from a White House staffer, ascends to new heights of long-term aspiration—Vice President in a Quayle Administration. Preposterous? Not so, says the rumormonger, noting Healy has developed a close working relationship with the VP.

***Mosaic*, the stylish science quarterly published by NSF since 1970, has fallen prey to NSF's industrial competitiveness syndrome. An epitaph in the current, and final issue, proclaims the "increased need to communciate with several new audiences," and also notes "these times of difficult budgets." NSF has been spending about $600,000 a year on the magazine. Editor Warren Kornberg is seeking a reincarnation with a private publisher.**

. . . House Appropriates Skimpy Increase for NIH

(Continued from Page 1)

these circumstances is a tribute to the political lure of mega-technology and the inability of Congress to sort out scientific and technological priorities.

Science is not alone in absorbing fiscal pain from this deficit-obsessed government, but this year it is absorbing far more than it is accustomed to. The reason, of course, is that the 1990 budget agreement between Congress and the White House set rigid ceilings on outlays and spending authority through fiscal 1993, the budget year now under consideration in Congress. Like the drunk who threw away the liquor-cabinet key in a rare sober moment, the legislators have ever since sought to undo their act of fiscal rectitude. But, with minor exceptions, the budget rules are holding.

The shocker of the season may well be the NIH budget, which a devoted Congress has regularly swollen beyond Presidential requests in all but two of the past 20 years. In most seasons, the House leads the way in generosity for the health sciences. In customary anticipation of Congressional largess, the President asked for a modest increase, from the present $8.9 billion to $9.3 billion, for an increase of merely $445 million, a groundlosing figure for NIH.

Railing against the seemingly skimpy White House budget, the friends of NIH confidently expected relief from their traditionally reliable backers on the House Appropriations Committee. But the Committee registered below the President's miserly increase, voting for a rise of only $165 million.

The NIH battle now shifts to the Senate, where Tom Harkin (D-Iowa), Chairman of the NIH Appropriations Subcommittee, is aiming to undo the 1990 budget agreement and redeploy some $4 billion from the Pentagon to civilian agencies, NIH prominent among them. The odds are greatly against him.

Even worse injury has been inflicted on NASA, an agency rendered so desperate by ravenous financial needs that it now piteously depicts itself to Congress and the public as a job-creating agency, rather than the technological pioneer of yore. The Space Station has become the albatross of the Space Agency, but at this late stage, there's no letting go. Budgeted this year for $14.3 billion, the space agency was slated by the White House for an increase to $14.9 billion.

The House, however, cut out nearly $1 billion, with about half of it taken from the Space Station—leaving NASA with $278 million less than this year's budget. Even so, the Space Station came out of the House with a colossal $1.7 billion for 1993, about the same sum that the National Science Foundation has in its account this year for "research and related activities."

The Senate Appropriations Committee for NASA was a touch less harsh, voting a budget only $163 million below this year's level. In any case, a great deal more is required annually just to stand still into today's R&D economy, and NASA is destined next year for a lot less.

NSF is also having a bad season on Capitol Hill. Budgeted for $2.5 billion this year for all its activities, the Foundation went into the Congressional appropriations mill with a good sendoff from the White House—a request for a $457-million increase. But the House voted to raise the budget by only $153 million. The Senate, yet to act on the bill, has a recommendation from its Appropriations Committee for an increase of $162 million.

The big NSF boost proposed by the White House was supposed to put the Foundation back on the path to a Presidentially promised doubling of its budget in some nearby year. Reagan made a four-year doubling pledge in 1987, and Bush has reaffirmed it. But Congress, though rhetorically devoted to research, has never funded NSF at the required pace. And now, five years later, there's some confusion about doubling from what date and whether the sums are in everyday money or money adjusted for inflation.

A poor outcome also faces what is normally another Congressional favorite, the National Institute for Standards and Technology (NIST), cast by Congressional Democrats for a lead role in high-tech industrial rejuvenation. But, in the House version, the 1993 budget for NIST's scientific and technical services took a beating. The White House asked for $202 million, but the House Appropriations Committee voted $178 million—which is $4.5 million below the current budget. For NIST's Advanced Technology Program and other outreach efforts for industry, the White House requested $86 million. The Committee recommended $67 million—a turnabout, since the early Bush Administration ignored those programs while Congress forced money on them.

In the House, growth was also denied for agriculture research. The White House asked for a $26 million increase for the Agricultural Research Service, but the House Appropriations Committee held the 1993 budget to this year's level, $661 million. For the Cooperative State Research Service, the President aimed for a small reduction, from $431 million this year to $416 million next year. The

(Continued on Page 3)

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. . . Massey Urges "A Broader Spectrum of Research"

(Continued from Page 1)

bureaucracy and on Capitol Hill. Schmitt, a former GE Senior Vice President for Science and Technology and former Chairman of the NSF Board, is a past President of the Industrial Research Institute and a ubiquitous adviser for federal R&D agencies. Bement, TRW Inc. Vice President for Science and Technology, was a Pentagon research manager in the Carter Administration, and is also an advisory regular.

On August 16, two days after release of the Schmitt-Bement report, the Board approved a request by NSF Director Walter Massey for establishment of an NSB Special Commission on the Future of the National Science Foundation. With a membership of 15 to be announced shortly after Labor Day, the Commission is scheduled to report within 75 days—nicely timed for the post-election, pre-inauguration transition interval.

Around mid-September, NSF plans to issue a Strategic Plan that has been in preparation for about eight months. Tightly held by the NSF management, the plan has been described to SGR as a "framework" for NSF operations and a guide for the work of the newly organized Commission. Conversations with NSF managers left the impression that some of them are not quite sure what the framework is supposed to frame or how far the Strategic Plan extends into the misty future.

Massey said the Commission was needed to "examine options available to NSF in an external environment that has changed markedly in recent years"—a reference to the economy and industrial competitiveness supplanting the Cold War as Washington's prime motivator.

New directions for NSF, with emphasis on industry and technology, stand out in an accompanying charter for the Commission, signed by Massey and Science Board Chairman James Duderstadt, President of the University of Michigan.

The charter states that with the "steady growth of economic power in Europe and Asia, the nation increasingly looks to science and engineering as the source of technological advances that are necessary for economic prosperity and improved quality of life." It proceeds to assign the Commission to recommend whether NSF should assume a "major role in fostering the links between research and technology."

But, aware of the fiscal terrors that now grip university-based science, the charter also directs the Commission to "Examine the essential need for NSF to maintain its unique role as the premier supporter of research and education while assuming greater responsibility for developing links between academic science and industry." Memories are still fresh of the hostility engendered in academe when Massey's predecessor at NSF, Erich Bloch, launched a modest program of Engineering Research Centers—viewed by the small-grant crowd as coming out of their hide.

With the announcement of the Commission on the Future of NSF, Director Massey released a "Discussion Paper on the Future of NSF," addressed to the Science Board. Included in it are three options, presented in a fashion that leaves no doubt about Massey's assessment of the political conditions surrounding NSF and his preference for responding to them.

As a first option, Massey stated, NSF "could revert to its historical roots as a small agency predominantly dedicated to the support of individual investigators and small groups at universities. This would almost certainly mean discontinuing the programs that have sought to connect basic research with the user community—science and technology centers, engineering research centers, super-computer centers, industry-university cooperative research centers, and other such activities."

Scratch that one, he seemed to be saying.

The second option, Massey continued, would have NSF build "on its mission as a supporter of academic researchers with marginal and exploratory ventures in other areas, such as centers, initiatives in high-performance computing and advanced manufacturing, and programs linking universities and industry. It is very likely," he cautioned, "that this would be a path of unstable equilibrium, because the importance of these 'other areas' on the national agenda will require more than token efforts. It is likely that other agencies, new or existing, will be more than willing to devote serious efforts to such activities."

The giveaway there is "unstable equilibrium"—hard to sell in Washington.

The third option, "one that I prefer," Massey acknowledged, "is to build on our traditional mission and exercise new leadership across a broader spectrum of research areas.

(Continued on Page 4)

Budget Woes

(Continued from Page 2)

Appropriations Committee emerged with $412 million. In doing so, it held Agriculture's Competitive Research Grants Program at this year's level, $97 million, rather than the $150 million sought by the White House.

When Congress goes back into session next week, the final battles of the budget will commence, with the Senate finishing its work on the money bills, and then going into conference to resolve differences with the House. But there are no hidden pots of money to round out skimpy appropriations.

The budgetary mood was reflected in a comment on the NIH bill by Rep. Constance Morella, a Maryland Republican whose district includes Bethesda, home of NIH. Describing herself as distressed by the NIH budget reported out by the Appropriations Committee, Morella said, "I recognize that the Committee did the best that was possible under the restrictions imposed by this year's budget."—DSG

. . . Congress Prods NSF Toward Industrial Role

(Continued from Page 3)

NSF would adopt an expanded portfolio of programs that would be integrated with ongoing activities and closely allied with industry and other government agencies."

In this role, Massey explained, NSF would "encourage increased interaction" among federal, state, local, industrial, and academic institutions, both for research and education.

Events on Capitol Hill suggest that NSF's growing inclination toward industrial research may simply be a matter of harmonizing with the inevitable. The Bush Administration sought a $457-million increase for NSF, from $2.57 billion this year to $3 billion next year (fiscal 1993, beginning October 1). The House, accepting the verdict of its Appropriations Committee, held the increase to $153 million—a groundlosing figure in scientific purchasing power. The shortfall from the Presidential request does not reflect Congressional disfavor toward science. Rather, money is extraordinarily tight this year and, for budget purposes, NSF must compete directly in the appropriations process with housing for the poor and health care for veterans, both of which received substantial increases.

The Senate Subcommittee for NSF appropriations, chaired by Barbara Mikulski (D-Md.), seemed to be a trifle more generous than the House in dealing with NSF, voting for a $162 million increase in the overall NSF budget. But the Mikulski budget—yet to be taken up by the full Appropriations Committee and then the Senate—included sermonizing about the new era of R&D, and more than the usual allotment of internal rejiggering of NSF priorities. The details are spelled out in the Subcommittee's report, dated August 3.

After nodding to NSF's 40-year role as a mainstay of basic research in universities, the report declares that "the new world order requires the Foundation to take a more activist role in transferring the results of basic research from the academic community into the market place. The Committee believes the Foundation will play the key role in making the nation's academic infrastructure more accessible to those endeavoring to build America's technology base and improve US economic competitiveness."

While telling NSF that it will have to get along with some $350 million less than the President requested, Mikulski and company specified several industrial programs that are to be wholly or partially protected against sharing in the reductions. The outcome, of course, is a disproportionate burden on programs not favored by the Subcommittee.

Thus, Mikulski's Appropriations report tells NSF to expend the full $104 million requested by the White House for a "manufacturing initiative." And it goes into considerable detail about how it wants NSF to run the program. For example, the Subcommittee states that it is "setting aside $5 million of the increase in support to manufacturing to establish an industry-led institute that will bring together cross-disciplinary research teams from industry and universities to address fundamental issues critical to the development and implementation of agile manufacturing techniques and infrastructure."

The report goes on to advise NSF that "The Committee is troubled by the low level of industrial participation in most [NSF-supported] science and technology centers," and it directs NSF to submit a plan to correct this situation.

What this shift of sentiment and policy portends for the Foundation's traditional clientele is not clear at this point. NSF is an odd creation on the federal landscape—a wholly owned government subsidiary whose beneficiaries are allotted considerable influence over its policies and programs, big and little.

Presidents, who appoint the NSF Director, tend to be financially generous to the Foundation, and leave the details to the fulltime NSF staff and their outside advisers. As noted, however, Congress freely wades into internal NSF affairs, rearranging budgetary allocations and calling for more emphasis on this or that. In recent years, Capitol Hill has been urging NSF to get closer to industry, even closer than Erich Bloch sought to maneuver the Foundation during

(Continued on Page 5)

Readings on NSF's Future

The Competitive Strength of US Industrial Science and Technology: Strategic Issues (91 pp., no charge), report to the National Science Board by the NSB Committee on Industrial Support for R&D, brief for an expanded industrial role for NSF.

Charter of the National Science Board Commission on the Future of the National Science Foundation (NSB-92-145), outlines goals, organization, and schedule.

Discussion Paper on the Future of NSF (NSB-92-146; 7 pp.), memorandum, August 14, from NSF Director Massey to the NSB, discussing the current role of NSF in support of science and education and options for the future.

Order from: National Science Board, 1800 G St. NW, Washington, DC 20550; tel. 202/357-9582.

Department of Veterans Affairs and Housing and Urban Development, and Independent Agencies Appropriations Bill, 1993, Appropriations reports for NSF and several other agencies, including NASA, with many directives concerning what the agencies should and shouldn't do. House (Report No. 102-710; 129 pp.), Senate (Report No. 102-356; 204 pp.), both available without charge.

Order from: Documents Room, US Senate, Hart Building, Room B-04, Washington, DC 20515; no telephone orders.

Commentary: NIH Is Big Enough; Cap It, Start Another

The following is adapted from an article by SGR Editor Greenberg in the August issue of the Journal of NIH Research.

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After nearly half a century of fiscal forced feeding like a Strasbourg goose, the National Institutes of Health has some difficulty maneuvering its managerial mass beneath its corpulent midriff. The existing NIH is short of virtuoso performance in coping with its existing workload, let alone nourishing new opportunities on the frontiers of science.

It is in this context that the biomegalomanic NIH Strategic Plan, now gestating in Bethesda, must be viewed, along with the possibility that the NIH management has gone astray in planning for a great expansion of biomedical research well into the next century. To meet many national needs, biomedical research should indeed be expanded. But that doesn't mean that the present NIH should expand with it. Why not cap this behemoth and, in the interest of promoting bureaucratic brightness, innovation, and competition, entrust the expansion of biomedical research to a new-born institution, parallel to the old NIH, but independent of it?

Mortgaged to swarms of retainers abetted by scientific allies, lobbyists and political buddies, NIH is weighed by past commitments and connections, and is hardpressed to innovate. But even when it bestirs itself—usually under the Congressional lash—its sluggish stride adds a new dimension to the concept of all deliberate speed.

From among many examples, consider the Women's Health Initiative. Long overdue and warmly embraced and publicized by NIH Director Bernadine Healy and company, it was initially forced on a drowsy NIH bureaucracy by the Congressional Caucus for Women's Issues, outraged at learning of NIH's indefensible men-only enrollments in several major clinical trials. NIH promised to go straight. But four years after Congress had expressed its concern, the General Accounting Office concluded that NIH had "made little progress in implementing its policy to encourage the inclusion of women in research study populations." This episode is not an isolated case of resistance to innovation. Furthermore, the failings cannot be masked by the threadbare excuse of hiring chills and freezes crimping the staff power needed to manage new programs. The problems run deeper than staff counts.

However, despair is unwarranted. Bethesda's bureaucratic torpor need not be fatal to the Strategic Plan's expansionist, imperial goals. The difficulties are surmountable. For this purpose, the Greenberg Option (GO) is offered as a remedy (gratis, and even without indirect costs). The GO acknowledges the importance of the present NIH *and* the need for massively expanding biomedical research. The solution to this conundrum proposed by the GO is as follows:

(1) Cap the existing NIH at its current size, about $9 billion, plus an annual dollop for inflation to keep the enterprise intact, but without growth.

(2) Commit future real growth in federal biomedical appropriations to a new granting institution. Since next year's budget for NIH looks like a loser, a special appropriation may be required. But on the basis of recent appropriations patterns, several hundred million dollars should annually be available for the new NIH—about the same as the annual expenditures of the acclaimed Howard Hughes Medical Institute.

(3) Confine the newcomer to extramural support, the neediest sector in biomedical research, and focus on the often-forgotten sole purpose of the extramural program: timely delivery of money to highly promising, carefully selected research activities.

The proposed biomedical fission is desirable because, like many other aging institutions, NIH is settled in its ways, heavily mortgaged to established relationships, and short of innovative flair. If bureaucratic organizations, like biological creatures, have an optimal size, it may be speculated that NIH has swollen beyond its ideal dimension. In an era that has seen the disassembly of the Soviet Union and the shrinkage of the Pentagon, Sears, IBM, AT&T, GM, and many universities, NIH, rare among today's institutional giants, is demanding growth. Unexamined in all the hubbub is the crucial question of whether NIH can manage additional growth.

The Healy regime may eventually deliver on its promises of crisp, innovative administration. But the daunting reality is that NIH has taken on characteristics of the Postal Service. It is cumbersome, testy toward critics, and, in the venerable tradition of wobbling institutions, prone to inflated self-congratulations.

"The entire nation, indeed the entire world, has a stake in NIH's success," proclaims an early draft of the Strategic Plan, thereby equating the well-being of humanity with

(Continued on Page 6)

Future of NSF *(Continued from Page 4)*

his 1984-90 reign as NSF Director.

The issue isn't desirability. It's money. Whoever wins the election, severe pressures against growth in federal spending will continue to dominate government operations. Both candidates have recklessly vowed deficit reductions, with accompanying tax cuts promised by Bush and only minor tax increases promised by Clinton.

The high priests of science plead that science merits an exception because, they contend, it more than pays its way. But the evidence for that claim is shaky and disputed, especially since research often rewards countries that didn't perform it.

The Special Commission on the Future of NSF should have no difficulty prescribing a brilliant future for the Foundation. Selling itself to Congress is the real trial of NSF—and in recent years, it hasn't fared too well.—DSG

. . . At New NIH, Time in Meetings Would Be Penalized

(Continued from Page 5)

NIH's labyrinthine culture of some 15,000 researchers, managers, administrators, deputies, expediters, coordinators, chiefs, special assistants, reviewers, clerks, and groundkeepers, plus 3,400 visiting consultants distributed among 194 "standing" committees, and uncounted others.

For a coat of arms, the present NIH might adopt a snail imposed on a dollar sign. Consider, for example, the duration of the NIH application-review process, a constant source of irritation and disruption in the biomedical-research community. In 1982, 63 study sections, comprising 1097 members, reviewed 20,011 applications for research project grants. Box score: 317.6 applications per section, 18.2 per reviewer. Elapsed time, from receipt through study section review to final decision by the Institute councils, averaged nine months.

Last year, 83 study sections, with 1768 members, reviewed 25,330 applications. Productivity declined, to 305 applications per section and 14.3 per reviewer. Average elapsed time: nine months—unchanged.

The productivity decline, particularly per reviewer, is not inconsequential. It is surely due in some part to mounting regulatory requirements, scientific complexity, and staffing caps in the Division of Research Grants (DRG). In 1982, when grants totaled $2.5 billion, the DRG had 423 staff members. In 1991, when grants totaled $6 billion, the staff totaled 447—virtually unchanged, though funding had more than doubled.

Nonetheless, well into the second decade of the desktop-computer revolution, NIH—dealing with a highly computer-literate clientele—continues to shuffle paper in Dickensian fashion, though the burden has been horrendously multiplied by the tireless copying machine. Within the grant-review system, originals and copies have now burgeoned to *three billion* pieces of paper per year, by estimate of the NIH Division of Research Grants. The main innovation so far is elimination of NIH's renowned "pink sheets," containing reviewers' comments. Paper recyclers can't accommodate pink.

An electronic system for submitting grant applications and routing them to reviewers has been under development for five years. It is scheduled to be tested this year at 30 universities, but a fullscale deployment date is not even estimated. Don't expect it soon.

Another example of tired blood in Bethesda: In 1983, the House Appropriations Committee asked NIH to inventory its behavioral research activities and put more emphasis in that area. Two years later, when little had changed, the Committee took note of reports by the Surgeon General and the Institute of Medicine, and observed that they "indicate that 7 of the 10 leading causes of death in the United States, accounting for 50% of all mortality, are in part behaviorally determined." NIH reported that in a budget that then stood at $5 billion, $105 million could be identified as research related to health and behavior. Five years later, with the NIH budget at $7.1 billion, behavioral research had risen to $257 million. Understandably dismayed, the Senate Appropriations Committee directed NIH to prepare a 10-year plan of robust growth for behavioral research.

In 1990, an internal memorandum at NIH noted that despite "overwhelming evidence" of behavioral factors in disease, "the proportion of NIH funding dedicated to this critical work has remained at approximately 3 percent over the past 4 years, notwithstanding the [Senate] Committee's continuing directive that this percentage be increased."

Internally, the new NIH should be as paperless and as people-less as advanced electronics can permit. To avoid the siege mentality so prevalent in Bethesda, the new NIH should experiment with term limitations for administrators and grantees. It should also tinker with innovations in making awards, such as, for example, using a lottery to fund 2 percent of all rejected applications. The outcome might provide some useful insights into the value of the peer-review system.

At the new NIH, a small staff would be on the receiving end of electronically filed applications, which would then be electronically routed to peer reviewers. In the present NIH culture, face-to-face peer deliberations are sacrosanct, though extremely costly in terms of travel time and expenses for thousands of journeys to Bethesda. However, other granting agencies, including NSF, perform their reviews by telephone and mail, without harm to the quality of decisions.

The new, paper-free NIH would dispense with peer pow-wows and mail. As a boon to productivity, staff members would be docked $1 an hour for time spent in meetings. That's not enough to deter useful meetings but, cumulatively, it's sufficient to discourage the countless hours of vapid conference-table dawdling that fills the workday in Bethesda.

The automatic response from the entrenched NIH management will be that it can't be done. But, of course, it can be done, and the biomedical community out there has every reason to see that it is. Many details will have to be worked out before the new NIH is launched, including its location—preferably far from the senior NIH. Experience will suggest changes in its operations as it progresses. I would recommend a free-standing, independent agency, organizationally akin to NSF, disconnected from the politically baleful cabinet department in which the old NIH is unfortunately embedded. In the dynamics of Congressional politics, the proposal for another NIH is a winner, since it would enlarge the jurisdiction of the same committees and members who now lord it over the existing NIH.

The original NIH is a great institution, and long may it thrive. But those who care about the progress of biomedical research should ponder a lesson from animal husbandry: Hogs will grow as big as they're fed—and then finally expire when their legs collapse under insupportable weight.

More IN PRINT: Environment R&D, Mars, Microgravity

(Continued from Page 8)
President of Pfizer, Inc.

Previous publications in the series ($24.95 each, plus $3 shipping:

Modern Methods of Clinical Investigation (1990; 244 pp.)

The Changing Economics of Medical Technology (1991; 224 pp.).

Order from: National Academy Press, 2101 Constitution Ave. NW, Washington, DC 20418; tel. 1-800/624-6242; in the Washington, DC, area: 202/334-3313.

International Environmental Research and Assessment: Proposals for Better Organization and Decision Making (82 pp., no charge), from the Carnegie Commission on Science, Technology, and Government, a blue-ribbon assemblage of science-policy kibitzers staked by the philanthropic Carnegie Corporation, a call for beefing up national and multinational capabilities for environmental research, including establishment of an "International Consultative Group for Research on Environment." The proposed creation would review the state of research, encourage international collaboration and the establishment of national and multilateral research facilities. The report urges the US government, the World Bank, and private foundations to run with the proposal. The report was produced under a Steering Committee chaired by Rodney Nichols, Executive Director of the New York Academy of Sciences. Related publications produced earlier by the Commission are listed in the report.

Order from: Carnegie Commission on Science, Technology, and Government, 10 Waverly Place, New York, NY 10003; tel. 212/998-2150.

Job Changes & Appointments

At the German Embassy in Washington, ***Peter Wenzel-Constable*** has succeeded ***Irene Ruede*** as Counselor for Science, Technology, and Telecommunications. Ruede, who held the post for three years, has been appointed to the Berlin office of the Federal Ministry for Research and Technology to head the department responsible for coordinating research activities in the former East German states. Wenzel-Constable, an attorney, was formerly with the Ministry and worked on EUREKA, an EEC program to promote technological innovation.

Donald Lindberg, Director of the National Library of Medicine, part of the National Institutes of Health, will continue in that post while taking on a new assignment as Director of the Presidential Initiative on High Performance Computing and Communications, according to an announcement by Presidential Science Adviser D. Allan Bromley. Spread among several federal agencies, the Initiative is budgeted for $800 million next year and aims to develop a family of super-fast machines and a nationwide digital network.

SGR Summer Schedule

The next issue of *Science & Government Report* will be published October 1, 1992.

Biological Contamination of Mars: Issues and Recommendations (115 pp., no charge), from the Task Group on Planetary Protection, of the Space Studies Board, National Academy of Sciences, update of the Board's 1978 report *Recommendations on Quarantine Policy for Mars, Jupiter, Saturn, Uranus, Neptune, and Titan*. The new report was prepared at the request of NASA in anticipation of launches to Mars and the 1992 meeting of the Committee on Space Research of the International Council of Scientific Unions. A decade of research, the Task Group concludes, indicates that "the probability of growth of a terrestrial organism on present-day Mars is essentially zero." But it recommends extreme diligence in sterilizing payloads bound for Mars, adding that "the philosophical intent underlying the 1978 report—to protect Mars from terrestrial contamination so as not to prejudice future experiments aimed at detecting martian life—is still profoundly important."

Also from the Academy: ***Toward a Microgravity Research Strategy*** (62 pp., no charge), by the Space Studies Board Committee on Microgravity Research, a call for a "long-range research strategy" in reduced-gravitational fields—dripping with evident scorn at claims of Space Station promoters that their project is indispensable for this line of work and for manufacturing in space. The report states [with boldfaced italics] that "***no*** examples have been found of materials that are worthy of manufacture in space."

Order from: National Academy of Sciences, Space Studies Board, Harris Building, Room 584, 2001 Wisconsin Ave. NW, Washington, DC 20007; tel. 202/334-3477.

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In Print: Agriculture, National Parks, Health Technology

The publications listed are obtainable as indicated—not from SGR.

A New Technological Era for American Agriculture (GPO Stock No. 052-003-01290-1; 450 pp., $23), by the Congressional Office of Technology Assessment (OTA), last in a series of four reports on agriculture and technology, says that biotechnology and other advanced techniques can revolutionize agriculture, but that political and regulatory structures are rooted in old ways and public confidence is shaky. The report lists issues and options for Congress, with emphasis on developing guidelines for assessing risk and informing the public about genetically modified products and other offshoots of biotechnology. The report also observes that computer technology has had little direct impact on farming operations, but that big changes are rapidly approaching, including computer-based sensors for monitoring field and crop conditions, expert systems for farm management, and literature retrieval and alert systems.

(A 29-page summary of *A New Technological Era for American Agriculture* [OTA-F-475] is available without charge from: Office of Technology Assessment, US Congress, Washington, DC 20510-8025; tel. 202/224-8996.)

The full report is available from the Government Printing Office, as are earlier publications in the OTA series:

Agricultural Research and Technology Transfer Policies for the 1990s (GPO Stock No. 052-003-01182-4; 52 pp., $2.50);

US Dairy Industry at a Crossroad: Biotechnology and Policy Choice (GPO Stock No. 052-003-01238-3; 118 pp., $5.50);

Agricultural Commodities as Industrial Raw Materials (GPO Stock No. 052-003-01237-5; 115 pp., $5).

Also from OTA: ***Cystic Fibrosis [CF] and DNA Tests: Implications of Carrier Screening*** (GPO Stock No. 052-003-01291-0; 301 pp., $16), reviews the controversy over the utility and implications of genetic screening for CF, which afflicts 1700-2000 newborns per year, for a total of some 30,000 in the current population, with a median lifespan of 28 years. The screening, OTA notes, carries ominous implications for health-insurance coverage, employability, and other risks of stigmatization. In public-opinion surveys conducted for this study, OTA reports, it found high levels of confidence in the utility of genetic tests, but sparse public understanding of risk probabilities. The report notes scattered federal efforts to promote better public understanding of genetic screening, and points out that the presumed focal point, the National Center for Education in Maternal and Child Health Services (in the Department of Health and Human Services) has been reduced to a "passive resource" by budgetary restraints. OTA raises the possibility of increasing the Human Genome Project's current 5-percent set aside for studies of Ethics, Legal, and Social Issues. Congress could raise the level "at the expense of scientific and technical components," OTA says, and redeploy the money to public education grants.

Another from OTA: ***Retiring Old Cars: Programs to Save Gasoline and Reduce Emissions*** (GPO Stock No. 052-003-01288-0; 30 pp., $2.50), concludes that fuel consumption, air quality, and safety can benefit from the retirement of older cars—which account for a disproportionate volume of high fuel consumption and emissions. But OTA cautions that removal of aged cars can adversely affect the purchasing power of poorer citizens and that many unknowns exist about the nationwide effects of early automotive retirement. The report notes that since 1990, Union Oil Company of California has reaped "positive publicity" for offering cash bonuses for scrapping 7000 model-year 1970 and older cars registered in the Los Angeles Basin. The older cars there, OTA points out, comprise 6 percent of the auto population but produce 22 percent of the hydrocarbons, 15 percent of the carbon monoxide, and 13 percent of the nitrogen oxide.

Order OTA publications from (checks payable to): Superintendent of Documents, USGPO, Washington, DC 20402-9325; tel. 202/783-3238. Add 25 percent for foreign orders.

Science and the National Parks (122 pp., $19.95, plus $3 for shipping), from the National Academy of Sciences, observes that over the past 30 years, the National Park Service (NPS) has virtually ignored "more than a dozen major reviews" calling for more science and less "managerial guesswork" in running the parks. Score that as an "abysmal lack of response," says the report, by a committee chaired by Paul G. Risser, University of New Mexico. Sounding cautiously hopeful, a preface explains that the present report was commissioned in 1990 by NPS Director James M. Ridenour, who has "stated his intent" to go scientific. Recognition of the importance of research and its integration into management are essential, the report emphasizes. Of course, more money is needed, too, but "additional funding alone is not enough," the report states, adding—in a rare emotional departure from arid Academy prose: "Why is there controversy among NPS personnel about the role of science? Have the stewards of some of the nation's most precious resources become so engulfed in the flames of short-term crises that they believe they cannot afford long-term vision?"

Also from the Academy: ***Technology and Health Care in An Era of Limits*** (283 pp., $36, plus $3 for shipping), papers from the third in a series of workshops on "Medical Innovation at the Crossroads," conducted in April 1991 by the Institute of Medicine (IOM), health-policy arm of the Academy. Topics included health care in the UK and Canada, the Oregon Medicaid plan, diffusion of medical technology, and managed-care systems. The workshops were organized by the IOM Committee on Technological Innovation in Medicine, chaired by Gerald D. Laubach, former

(Continued on Page 7)